

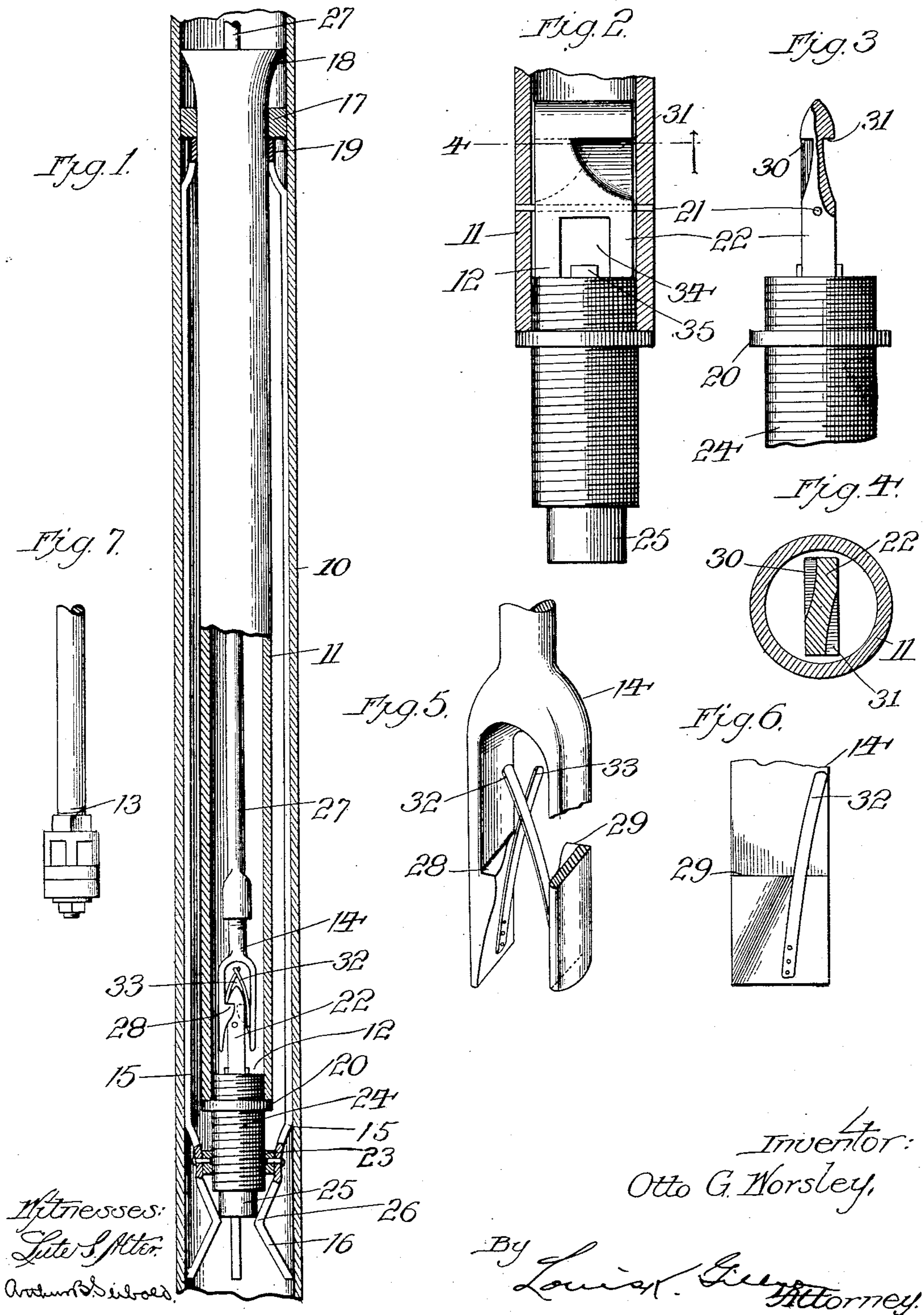
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O. G. WORSLEY.
PUMP.

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NO MODEL.



UNITED STATES PATENT OFFICE.

OTTO G. WORSLEY, OF NEWARK, ILLINOIS.

PUMP.

SPECIFICATION forming part of Letters Patent No. 751,596, dated February 9, 1904.

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To all whom it may concern:

Be it known that I, OTTO G. WORSLEY, a citizen of the United States, and a resident of Newark, county of Kendall, and State of Illinois, have invented certain new and useful Improvements in Pumps, of which the following is a specification and which are illustrated in the accompanying drawings, forming a part thereof.

This invention relates to that class of pumps which are used in drilled wells, the objects of the invention being to provide an anchorage for the pump and an improved packing for the barrel thereof. These objects are attained in the structure hereinafter described and which is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section, partly in elevation, of the pump and the well-casing. Fig. 2 is a detail longitudinal section of the pump, partly in elevation. Fig. 3 is a detail elevation of the valve-casing of the pump, partly in section. Fig. 4 is a transverse section on the line 4 of Fig. 2. Fig. 5 is a detail of the head of the wrench and grapple used in connection with the pump, partly broken away. Fig. 6 is a detail elevation showing the inner face of one leg of the wrench and grapple, and Fig. 7 is a detail of the sucker rod and valve.

In pumps of this character it has heretofore been the practice to place a strainer or other support at the bottom of the well-casing and rest the pump thereupon, and it has been the common practice to locate a packing-ring at the lower end of the pump-barrel to prevent the water from leaking back around the barrel. As a result of this practice it has been impracticable to locate the pump elsewhere than at the bottom of the well, although water might rise, the vein having once been found, a considerable distance. A disadvantage incident to the location of the packing-ring at the lower end of the pump-barrel arises from the filling in of the sand around the barrel, which becomes so completely impacted that it is practically impossible to remove the pump without destroying its barrel. These difficulties and others are overcome and the con-

struction and manipulation of the pump simplified by the herein-described structure.

The well-casing, which of course forms no part of this invention, is shown at 10. The pump-barrel 11 is an open-ended tube, usually of brass. The valve-casing 12 is screwed into the lower end of the barrel. The sucker rod and valve are shown at 13 and are of ordinary construction. The wrench and grapple is shown at 14.

The pump-anchor comprises a plurality of outwardly-bowing spring-bars 15, the lower ends of which flare outwardly, constituting gripping-toes 16, adapted to bite into the casing 10. The packing-ring 17, preferably of rubber, encircles the upper portion of the barrel 11 and is interposed between a shoulder 18 thereof and a ring 19, loosely encircling the pump-barrel and to which the upper ends of the bars 15 are secured. The shoulder 18 is preferably formed by flaring the upper end of the pump-barrel, so that as the barrel is drawn downwardly through the ring the latter will be expanded by the increasing size of the barrel.

The valve-casing 12 is preferably formed with an annular shoulder 20, adapted to abut against the end of the barrel 11, and after the casing has been screwed into the barrel the two are locked against rotation by means of a pin 21, set through the barrel and an upwardly-extending shank 22 of the valve-casing.

Near their lower ends the bars 15 are united by means of a ring 23, which is internally threaded and runs upon a threaded downward extension 24 of the valve-casing 12. The lower end of this extension is without threads and serves as an expander to engage the angle 26 of the inwardly-bent toe portions 16 of the bars 15.

Preliminary to the lowering of the pump into the well-casing the several parts are assembled. The valve-casing 12 having been secured within the lower end of the barrel and the ring 17 having been mounted thereupon, the pump, which may be said to consist of the barrel and the valve-casing, is inserted into the anchored cage, passing freely through

the ring 19 and being screwed into the ring 23, but not a sufficient distance to engage the toes 16. Normally the bars 15 bow outwardly between the rings 19 and 23, giving the cage a greater diameter than the well-casing, while the toes 16 are contracted, so that their extreme ends are spaced diametrically a less distance than the diameter of the casing. The pump and its cage having been forced into the casing against the resistance of the bowed bars 15 is lowered to the position at which it is to be anchored and then being turned is screwed down into the ring 23, the friction of the bars 15 against the casing preventing the cage from turning, the expander 25 forcing the toes 16 outwardly and into engagement with the casing and the shoulder 18 being drawn into or against the packing-ring 17, so as to expand the latter. The pump is not only securely anchored by the engagement of the toes, but is perfectly packed. The pump may of course be readily removed or shifted up or down in the casing by turning it back in the cage so as to release the toes 16 and disengage the packing-ring 17.

The pump is controlled by means of a bifurcated wrench or grapple 14, which fits down upon the upwardly-projecting stem 22 of the valve-casing 12 and is provided with shoulders 28 29, extending inwardly from opposite sides of its legs, each shoulder extending approximately half-way across the leg upon which it is formed. The stem 22 is provided with corresponding shoulders 30 31, similarly disposed, so that they may be engaged by the shoulders 28 29.

Leaf-springs 32 33 are secured to the inner faces of the legs of the wrench or grapple and extend inwardly from their ends, each spring being opposite the shoulder upon the other leg and its free end being inclined toward the same. By the action of these springs the shoulders of the wrench and valve-casing stem are held in engagement. The wrench is disengaged from the valve-casing by being simultaneously turned against the resistance of the springs 32 and 33 and pulled upwardly, being controlled by a rod 27. The stem 22 is apertured, as shown at 34, to provide clearance for the valve, the stem of which is shown at 35.

Even though the pump be located near the bottom of the well a strainer is ordinarily not required, for the reason that as no support is located below it there is an unobstructed passage for the water the full width of the casing, so that the water is drawn up so slowly that the sand is not agitated.

I claim as my invention—

1. A pump-supporting anchor having a threaded nut and radially-movable wall-engaging toes, and an expander in threaded en-

gagement with the nut, and detents secured to the nut and adapted to engage the well-casing to hold the nut against rotation.

2. A pump-anchor comprising a top and bottom ring, outwardly-bowing spring-bars attached to the rings and having their lower ends prolonged beyond the ring and bent inward and then outward.

3. In combination, a pump-anchor having outwardly-bowed spring-bars and outwardly, flaring toes bent inward between their ends, and a pump of less diameter than the anchor but of greater diameter than the normal diametric distance between the bends of the toes thereof.

4. In combination, a pump-anchor having an internally-threaded ring, longitudinal outwardly-bowing spring-bars and inwardly-bent flaring toes, and a pump having its lower end threaded to engage the anchor-ring.

5. In combination, a cage having a threaded ring, a pump having threaded engagement with the ring and having an annular shoulder, and an expansible packing-ring located between the pump-shoulder and a portion of the cage.

6. In combination, a pump-anchor having an internally-threaded body portion, outwardly-bowing longitudinal springs, and radially-movable supporting-toes; a pump-body having a tapering portion and being in threaded engagement with the anchor-body; and an expansible packing-ring interposed between the tapering portion of the pump-body and the anchor.

7. In a pump, a barrel having a flaring upper end; an anchor-cage comprising an upper ring loose upon the barrel, a lower ring in threaded engagement with the barrel, spring-bars secured to the two rings and bowing outward therebetween and radially-projecting gripping-toes at their lower ends such toes being bent inward between their ends; a packing-ring interposed between the upper ring and the flaring portion of the barrel; and an expander at the bottom of the barrel and engaging the bent portion of the toes.

8. In a pump, in combination, an anchor-cage having radially-movable gripping-toes; a barrel in threaded engagement with the cage and having an expander cooperating with the toes; an upwardly-projecting flattened stem attached to the barrel and having lateral shoulders; and a wrench and grapple recessed to receive the stem and having internal shoulders cooperating with the shoulders of the stem.

OTTO G. WORSLEY.

Witnesses:

E. S. PERKINS,

H. N. COURTRIGHT.